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Electronic Services - Los Angeles
M11506X

MODEL 59 LF
MEGACYCLE METER

Operating INSTRUCTIONS

MEASUREMENTS
A McGRAW-EDISON DIVISION
BOONTON NEW JERSEY

OPERATING INSTRUCTIONS
for

MODEL 59 LF
MEGACYCLE METER

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MEASUREMENTS CORPORATION

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Laboratory Standards
MEASUREMENTS
A McGraw-Edison Division
BOONTON, NEW JERSEY

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Additional information with regard to the applications and maintenance of this equipment will be available from time to time. Users of the Model 59 LF Megacycle Meter are urged to discuss their problems with us and to suggest such modifications as might make the instrument more adaptable to their special requirements.

Maintenance difficulties should be reported to Measurements before proceeding with actual repairs, since, through our familiarity with the instrument we are able to suggest the appropriate repair procedure.

Engineering Department

MEASUREMENTS
Div. of McGraw-Edison Co.

Boonton, New Jersey

U. S. A.

Figure 1. Model 59 LF Megacycle Meter

CHAPTER 1

INTRODUCTION

SECTION I

GENERAL

1. SCOPE OF MANUAL

a. This manual describes the basic operation, construction and maintenance of the Model 59 LF Megacycle Meter. Following the text of the manual are two appendices. Appendix I describes the recommended procedure for preparing the instrument for prolonged storage or reshipment. Appendix II contains an Identification Table of Replaceable Parts, listing reference symbols, name and description, function and drawing number of each part required for maintenance.

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SECTION II

DESCRIPTION AND DATA

2. GENERAL

a. The Model 59 LF Megacycle Meter, see Figure 1, consists of a compact oscillator connected to its power supply by a small flexible cord. It covers a frequency range of 100 kilocycles to 4.5 megacycles and may be used as follows:

(1) As a grid-dip meter.
(2) As a variable-frequency oscillator, either modulated, or unmodulated.
(3) As an absorption wavemeter.
(4) As an oscillating detector, or as a tuned diode detector.

b. The octagonal case is functionally designed to provide a maximum of convenience in positioning the instrument. The bottom of this case contains a standard 1/4 - 20 tapped camera socket for tripod, or camera fixture, mounting. The hook on the bottom of this case fits the slot located on the top right-hand edge of the power supply.

3. TECHNICAL CHARACTERISTICS

a. FREQUENCY CHARACTERISTICS:

(1) Continuously variable from 100 kilocycles to 4.5 megacycles with four plug-in coils.

(2) Ranges:

.1	to	.25	megacycles
.25	to	.55	megacycles
.55	to	1.5	megacycles
1.5	to	4.5	megacycles

b. FREQUENCY CALIBRATION:

(1) Each unit is individually calibrated to better than 2% accuracy. However, the accuracy obtainable under operating conditions depends on the technique of the user. This technique is described in Paragraph 23.

(2) The calibration is essentially linear over the entire frequency range.

c. MODULATION:

(1) CW or 120 cycles, or external modulation.

d. POWER SOURCE:

(1) 117 volts, 50-60 cps.

(2) Power input 30 watts.

Megacycle Meters are available in the following ranges:

Model 59 LF	0.1 to 4.5	Megacycles
Model 59	2.2 to 420	Megacycles
Model 59 UHF	420 to 940	Megacycles

These oscillator heads plug into a common power supply.

---

4. COMPONENTS SUPPLIED

TABLE I. TABLE OF COMPONENTS

Quan.	Description	Overall Dimensions			Unit Weight
		Height	Width	Depth	
1	Model 59 Power Supply	7-7/8"	5 5/8"	8 1/2"	6 1/2#
1	Model 59 LF Megacycle Meter Head	3 5/8"	4 5/8"	4 5/8"	1 3/4#
1	Model 59 LF Set of Coils	3 1/8"	5-1/4"	2 5/8"	3/4#
1	Tube, RETMA #0D3/VR-150, installed				
1	Tube, RETMA #5Y3GT, installed				
1	Tube, RETMA #6C4, installed				

5. EXPORT PACKAGING

a. Packed for export, the Model 59 LF is crated in a wooden box.

TABLE II. EXPORT PACKAGING DATA

Number of Packages	Dimensions			Weight	Volume Cu. ft.
	Height	Width	Depth		
1	18"	13"	19"	30#	2.6

CHAPTER 2

OPERATING INSTRUCTIONS

SECTION I

SERVICE UPON RECEIPT OF EQUIPMENT

6. UNPACKING

a. Take care when unpacking or handling the equipment. Follow the procedure outlined below when unpacking the instrument.

(1) Place the packing case in a location where it can be opened easily.
(2) Follow the instructions for slitting the carton and removing the filler as printed on the label on the carton.

7. PRELIMINARY PRECAUTIONS

a. Connect the Model 59 LF oscillator unit to the power supply unit by inserting the plug at the end of the oscillator cable into the octal socket at the rear of the power supply.

b. Remove the coil set from its storage space in the rear of the power supply and clip it in place at the top rear edge of the power supply unit as shown in Figure 1. Select the coil having the desired frequency range and plug it into the oscillator unit.

c. Connect the Model 59 LF to a power source of 117 volts, 50 to 60 cycles.

SECTION II

CONTROLS AND INSTRUMENTS

8. POWER

a. The POWER switch, S1, is located on the right-hand side of the front panel apron. This switch controls application of line voltage to the primary of the power transformer, T1.

b. The pilot light, E1, is located on the left-hand side of the front panel apron.

9. DIODE - C.W. - MOD.

a. The DIODE - C.W. - MOD switch, S2, is located at the top of the power supply unit near the handle.

b. In the DIODE position, the plate voltage is removed from V201 (6C4) changing this tube from an oscillator to a diode detector. In this position the instrument may be used as an absorption wavemeter.

c. In the C.W. position plate voltage is applied to the oscillator V201 (6C4). In this position the instrument may be used as a grid-dip meter.

d. In the MOD position, the oscillator V201 (6C4) is modulated by 120 cycles. External modulation of the oscillator may be used by connecting an external source at the MOD jack on the front panel.

10. GRID CURRENT METER

The grid current meter, M1, indicates the relative grid current of the oscillator V201 (6C4) in the C.W. or MOD position of S2. In the DIODE position, the meter indicates diode current.

11. SENSITIVITY CONTROL

The SENSITIVITY control R6 on the front panel apron provides a means for adjusting the grid current for on-scale readings.

12. PHONES

a. The PHONES jack is located on the front panel apron. Headphones may be used in the C.W. and MOD. position of S2 to obtain a beat between an oscillator of unknown frequency and the Model 59 LF oscillator. When headphones are used, the grid current meter, M1, is disconnected by the jack, J2. When S2 is in the DIODE position, the headphones will produce an audible output for modulated signals.

13. TUNING

a. The frequency tuning knob for Model 59 LF is located on the oscillator head.

SECTION III

OPERATION

14. INSTALLATION AND ADJUSTMENT

a. The Model 59 LF Megacycle Meter requires no permanent installation.

b. The octagonal case is functionally designed to provide a maximum of convenience in positioning the instrument. The bottom of this case contains a standard 1/4 -20 tapped camera socket for tripod, or camera fixture, mounting.

15. PRELIMINARY OPERATIONAL CHECKS

a. Plug the coil selected into the oscillator unit, connect the oscillator to the power supply and the line cord to the power source as described in Paragraph 7.

b. Place the POWER switch, S1, in the up position. The pilot light will indicate that the power is applied. Allow one minute for the tubes to warm-up.

c. Place DIODE - C.W. - MOD. switch, S2, in C.W. position and adjust the SENSITIVITY control for a meter reading about mid-scale. The grid current should stay on scale as the tuning control is varied over the band. The unit is now ready for use as a grid-dip meter.

d. Place DIODE - C.W. - MOD. switch, S2, in MOD position and adjust the SENSITIVITY control for an on-scale meter reading. The internal 120-cycle modulation provides a convenient means for identifying the signal generated by the oscillator when it is used as a signal generator. External modulation can be applied through the standard phone jack marked "EXT. MOD."

e. Place DIODE - C.W. - MOD. switch, S2, in DIODE position and adjust SENSITIVITY control for maximum meter reading. The oscillator head may now be coupled into an active circuit and tuned for maximum meter response. Under these conditions the unit operates as an absorption wave-meter.

16. OPERATION AS A GRID-DIP OSCILLATOR

a. Adjust controls as indicated in Paragraph 15c. Couple into a passive circuit whose resonant frequency is to be determined. Tune over the frequency band until a dip occurs in the grid current indicating an absorption of oscillator energy. Back off on the coupling until a very small dip is obtained by tuning over the same general frequency range. Greater accuracy is obtained by the use of loose coupling once the approximate frequency of the resonance has been established.

17. OPERATION AS A VARIABLE-FREQUENCY OSCILLATOR

a. Adjust controls as indicated in Paragraph 15c. Set to desired frequency by means of tuning knob. Couple to circuit under test either inductively or capacitively.

18. OPERATION AS AN ABSORPTION WAVEMETER

a. Adjust controls as indicated in Paragraph 15e. Couple into active circuit and tune Megacycle Meter for maximum meter response.

19. OPERATION WITH PHONES

a. Phones can be plugged into the PHONE jack for indication of a dip. A sharp click accompanies the dip in grid current for conventional grid-dip application. It is convenient to use this technique to check the resonant frequency of high-Q circuits, quartz crystals, etc.

b. If indication of frequency of an oscillator is required, the phones will permit use as an oscillating heterodyne detector with its resultant zero-beat method of accurate frequency determination.

c. As a non-oscillating diode detector (switch S2 on DIODE) for the identification of modulated signals, oscillator harmonics, sound of parasitics of blocking character, etc., Model 59 LF will be found very useful.

20. INDUCTIVE COUPLING

a. Inductive coupling is recommended for coupling to a coil in a resonant circuit. The self-resonant frequency of a coil may also be obtained by coupling it inductively to the Megacycle Meter.

b. The proper relative orientation of the coil in the Megacycle Meter to the coil under test is easily determined experimentally. The plug-in coil forms are transparent so that the coupling positions for maximum and minimum coupling may be determined visually.

c. It is possible to couple inductively to toroidal coils by orienting them properly with respect to the oscillator coil. In most cases, the plane of the toroidal core should be at right angles to the plane of the oscillator coil.

d. If a coil is so mounted that the oscillator head may not be brought close to it, a link circuit may be used to couple to the coil. The link circuit may be made of a one- or two-turn

coil connected to each end of a piece of power cord, or twin-conductor transmission line. One of these coils is coupled to the coil under test while the other is coupled to the oscillator coil.

21. CAPACITIVE COUPLING

a. A 4.7 micromicrofarad capacitor, C206, is connected to a phone-tip jack located to the left of the coil to permit capacitive coupling to test circuits.

b. A lead plugged into the phone-tip jack may be connected directly to a high-impedance point on a resonant circuit for the usual grid-dip application. In general, the 4.7 micromicrofarad capacitor will provide tighter coupling than is desirable for the accurate determination of the frequency of the resonant circuit. Looser coupling may be obtained by forming a small capacitor in the coupling lead by twisting two insulated sections of the lead together to form a small capacitor in series with the lead. This auxiliary capacitor should be kept as small as possible for accurate frequency determinations.

c. With capacitive coupling, it is possible to couple to resonant circuits which are completely inclosed in a shield such as intermediate-frequency coils, shielded toroidal coils, etc.

22. SPECIAL MEASUREMENTS

a. It is possible to measure the resonant frequency of a quartz crystal by holding it close to the oscillator coil, or by coupling it capacitively to the phone-tip jack. In either case, loose coupling is required for accurate frequency determination. Since the Q of the crystal is high, it is desirable to use head phones to determine the grid dip with its accompanying "click" in the phones.

b. The Model 59 LF can be used for measuring capacitance by connecting the capacitor to a coil of known inductance. Alternatively, the unknown capacitor may be connected in parallel with a calibrated variable capacitor connected to a coil and tuned to resonance at a given frequency. The change in capacitance required to restore resonance is equal to the unknown capacitance.

c. The inductance of inductors can be determined by connecting them to a known fixed capacitor, or to a calibrated variable capacitor, and measuring the resonant frequency with the Model 59 LF. Reference to standard Reactance-Frequency graphs will facilitate the determination of the value of the unknown inductance.

23. FREQUENCY ACCURACY OF MEASUREMENT

The greatest frequency accuracy of the Model 59 LF can be obtained by proper use of the instrument. In general, if the coupling to the circuit under test is too close, the oscillator will be detuned or "pulled". To obtain the greatest accuracy, couple the Model 59 LF tightly to the circuit under test for the initial search of a dip in grid current or zero beat. After the initial indication is obtained, decrease the coupling as much as practicable while still obtaining an indication.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

SECTION I

MAINTENANCE

24. GENERAL

a. Preventive maintenance procedure is not recommended for the Model 59 LF. Preventive maintenance is a series of operations including inspection, adjustment, lubrication, etc., recommended periodically for certain types of equipment to eliminate the possibility of unexpected interruptions in service. Critical adjustments may be disturbed by too-frequent inspection by personnel unfamiliar with the design of the Model 59 LF. This may result in maladjustments causing errors in data that would be much more serious than an occasional operational failure.

b. If failure occurs, the instrument should be checked by the procedure outlined in Paragraph 15 (Preliminary Operational Checks), and if trouble other than a defective tube is indicated, the instrument should be returned to Measurements Corporation.

25. TUBE REPLACEMENT

a. To replace the tube in the Model 59 LF oscillator unit, remove the tuning knob, and remove the screws located on the right and left edges of the top cover (do not disturb the screws above the name "MEGACYCLE METER"). Lift the cover off. To take one side off, remove the four screws holding the side in place. Further disassembly is not recommended.

26. CIRCUIT FAILURE

a. Most circuit failures will be evident from indications of the grid current meter, M1, and reference to the schematic diagram. Failure to oscillate may result if the unit is dropped. In this event, it is advisable to return the instrument to the factory for repair.

CHAPTER 4

EQUIPMENT USED IN CONJUNCTION WITH MODEL 59 LF

SECTION I

ACCESSORIES

27. RECOMMENDED ACCESSORIES

a. No special accessories are normally required.

b. Auxiliary calibrated capacitors and inductors may be employed to make capacitance and inductance measurements as outlined in Paragraph 22.

c. A high-quality Signal Generator such as Measurements Models 65-B or 82 may be employed to check the frequency calibration of the Model 59 LF when required.

CHAPTER 5

TECHNICAL SERVICE -- MAINTENANCE INSTRUCTIONS

SECTION I

GENERAL

28. SCOPE

a. The purpose of this chapter is to acquaint operating and maintenance personnel with the theory of operation of the various circuits in the Model 59 LF.

b. Return the instrument to Measurements, Boonton, N.J. whenever repairs involving replacement of components in the oscillator section are necessary.

SECTION II

CONDENSED THEORY OF OPERATION

29. GENERAL

a. The Model 59 LF Megacycle Meter consists of two units - the oscillator head and the power supply unit.

30. POWER SUPPLY

a. The power supply consists of a full wave rectifier with a voltage regulator tube V2 (0D3/VR150) at the output of the filter consisting of R13, L1, C1, and C2.

b. The meter M1 is connected in a bridge circuit consisting of R5, R6, and R7.

c. Internal modulation of 120 cycles is applied from pin 8 of V1 (5Y3GT) to the plate supply of V201 (6C4) by means of C7, C8, and R14.

31. OSCILLATOR HEAD

a. The tube V201 (6C4) is connected in a tuned-plate oscillator circuit with a grid coil providing the feedback.

b. The plate of the oscillator tube is tapped down on the plate coil in order to minimize the effect of tube loading

and change in frequency calibration with change in tube.

c. The plug-in coils are carefully designed to provide good coupling with a minimum of grid-current variation as the oscillator is tuned over each band.

d. The oscillator is tuned by means of the capacitor C203.

SECTION III

TROUBLE LOCATION

32. LOCALIZING THE TROUBLE

a. Trouble may be quickly localized by making the preliminary operational checks described in Paragraph 15.

b. To open the case of the Model 59 LF head, remove the tuning knob and remove the screws located on the right and left edges of the top cover (do not disturb the screws above the name "MEGACYCLE METER"). Lift the cover off. To take one side off, remove the four screws holding the side in place. Further disassembly is not recommended.

33. REPLACEMENT OF V201 (6C4)

a. When replacement of the oscillator tube V201 (6C4) is necessary, remove cover and one side of the Model 59 LF head in accordance with instructions of Paragraph 32b.

b. By trying a few 6C4's the tube best suited to match the original performance can be found. Minor adjustment in the frequency calibration may be made by loosening the two screws holding the fiducial and rotating the fiducial slightly.

SECTION IV

PRE-ADJUSTMENT PROCEDURE

34. TEST EQUIPMENT REQUIRED

a. The only test equipment required is that which is necessary for checking frequency calibration. A high-quality Signal Generator such as Measurements Corporation Models 65-B or 82 may be employed to check the frequency calibration of the Model 59 LF Megacycle Meter.

SECTION V

ADJUSTMENT PROCEDURES

35. GENERAL

a. The only adjustment procedure recommended is that required for the replacement of V201 (6C4). This procedure is explained in Paragraph 32.

APPENDIX I

1. STORAGE

a. Remove dust from controls and outer surface of instrument with a clean rag.

b. Wrap instrument in heavy wrapping paper and seal seams with gummed tape or similar adhesive.

c. Store in a dry place. If excessive humidity is unavoidable, the wrapped instrument should be placed in a moisture-proof bag with a sufficient quantity of drying agent, such as silica gel, to insure a dry atmosphere.

(1) When the use of bag and desiccant is necessary, the instrument should be checked at 6-month intervals to determine the effectiveness of the seal.

2. SHIPMENT

a. Wrap the instrument with heavy wrapping paper and seal seams with gummed tape or similar adhesive.

b. Place in fibre-board carton or wooden box large enough to permit at least 3 inches of excelsior or similar packing material between the instrument and sides of the box.

(1) For export packing, the instrument must be wrapped in waterproof paper and the seams sealed with glue or similar sealing compound before being placed in a wooden box.

APPENDIX II

TABLE OF REPLACEABLE PARTS

A. MODEL 59 LF OSCILLATOR

SYMBOL	DESCRIPTION	FUNCTION
C201	CAPACITOR: fixed; ceramic; .001 mf, GMV, 1000 vdcw; 9/32" dia; two radial leads 1" min. lg. Measurements Corp. Dwg. H-5500.	Plate coupling
C202	CAPACITOR: Same as C201.	Grid capacitor
C203	CAPACITOR ASSEMBLY: variable; 1 section; air dielectric; 12 to 480 mmf; 1-27/32" h. x 3-9/16" w. x 1-27/32" d; 1/4" dia. x 1-1/8" lg. shaft; four .166 dia. mtg. holes on 1-21/64" x 3-3/16" centers; includes hub for mtg. dial. Measurements Corp. Part H-4915.	Tuning capacitor
C204	CAPACITOR: fixed; ceramic; .01 mf, GMV; 600 vdcw; 9/16" dia. x 5/32" thk; two radial leads 1-1/2" lg. Measurements Corp. Part H-5356.	Meter by-pass
C205	CAPACITOR: fixed; ceramic; 2.2 mmf $\pm$ .25 mmf, NPO; 600 vdcw; .200 dia. x .400 lg; two radial leads 1-1/2" lg. Measurements Corp. Part H-5502.	Tank loading capacitor
C206	CAPACITOR: fixed; ceramic; 4.7 mmf $\pm$ 5%, NPO; 1000 vdcw; 9/32" dia; two radial leads 1" min. lg. Measurements Corp. Part H-5503.	Capacity-couplin capacitor
E201	KNOB: round, fluted; black phenolic resin; 1-3/8" dia. x 11/16" h; fits 1/4" dia. shaft; two #8-32 set screws 90 deg. apart; brass insert. Measurements Corp. Part H-2788.	Tuning knob
H-201	FOOT: mounting; rubber; 7/8" dia. x 1/2" h; 10-32 x 3/8" lg. mtg. stud. Measurements Corp. Part H-5507.	Supports for R.F. unit.

TABLE OF REPLACEABLE PARTS

A. MODEL 59 LF OSCILLATOR

SYMBOL	DESCRIPTION	FUNCTION
J201	JACK: tip; black plastic body; 3/8" dia. x 29/32" lg; beryllium copper contacts. Measurements Corp. Part H-5506.	Capacity coupling jack
J202	SOCKET: 5 contact; 3 piece mtg; round steatite body 1-1/4" o.d. x 7/16" lg. excluding terminals; assembled with retainer ring to a nickel-plated steel mounting plate having two 1/8" x 5/16" lg. slotted holes on 1-11/16" center; silver plated phosphor bronze contacts. Measurements Corp. Part H-5505.	Socket for plug-in oscillator coils
L201	COIL: R.F; DOUBLE WINDING of 7/41 Litz wire, Univ. wound on iron core, inner winding 20 turns; outer winding 295 turns (5850 uh) tapped 15 turns from start; approx. 1-1/16" o.d. x 3/4" lg; 9/64" dia. mtg. hole. Measurements Corp. Part H-4927, or Part H-4923 for complete Plug-In Coil Assembly.	Oscillator coil
L202	COIL: R.F: double winding of 7/41 Litz wire, univ. wound on iron core; inner winding 7 turns; outer winding 125 turns (1125 uh) tapped 15 turns from start; approx. 1" o.d. x 3/4" lg; 9/64" dia. mtg. hole. Measurements Corp. Part H-4928, or Part H-4924 for complete Plug-In Coil Assembly.	Oscillator coil
L203	COIL: R.F; double winding of 7/41 Litz wire, univ. wound on iron core; inner winding 4 turns; outer winding 49 turns (195 uh) tapped 10 turns from start; approx. 1" o.d. x 3/4" lg; 9/64" dia. mtg. hole. Measurements Corp. Part H-4929, or Part H-4925 for complete Plug-In Coil Assembly.	Oscillator coil
L204	COIL: R.F; double winding of 7/41 Litz wire, univ. wound on iron core; inner winding 3 turns; outer winding 17 turns (27.5 uh) tapped 5 turns from start; approx. 1" o.d. x 3/4" lg; 9/64" dia. mtg. hole. Measurements Corp. Part H-4930, or Part H-4926 for complete Plug-In Coil Assembly.	Oscillator coil

TABLE OF REPLACEABLE PARTS

A. MODEL 59 LF OSCILLATOR

SYMBOL	DESCRIPTION	FUNCTION
P201	CONNECTOR: OCTAL PLUG; metal cap; bushing, Measurements Part H-5314.	R.F. unit to power supply connection, mates with J3
R201	RESISTOR: fixed; composition; 10,000 ohms ± 10%, 1/2 w; 9/64" dia. x 3/8" lg; insulated; two axial wire leads 1-1/2" lg. Measurements Part H-3728-103.	Plate resistor
R202	RESISTOR: fixed; composition; 15,000 ohms, ± 10%, 1/2 w; 9/64" dia. x 3/8" lg; insulated; two axial wire leads 1-1/2" lg. Measurements Part H-3728-153.	Grid resistor
R203	RESISTOR: fixed; composition; 240,000 ohms ± 5%, 1/2 w; 9/64" dia. x 3/8" lg; insulated; two axial wire leads 1-1/2" lg. Measurements Part H-3727-244.	Tank loading resistor
R204	RESISTOR: fixed; composition; 1000 ohms ± 10%, 1/2 w; 9/64" dia. x 3/8" lg; insulated; two axial wire leads 1-1/2" lg. Measurements Part H-3728-102.	Damping resistor
V201	TUBE: electron; 6C4.	Oscillator Tube
W201	CABLE, FLEXIBLE: special purpose; electrical; five conductors; flexible, cotton covered cable; approx. 5 ft. lg. Measurements Part H-886.	Provides connection between oscillator and power units
XV201	SOCKET: TUBE; 7 contact miniature; 1 piece saddle mtg; two 1/8" dia. holes on 7/8" mtg. ctr.; round mica-filled phenolic body; 3/4" dia. x 5/16" h. excluding terminals; beryllium copper silver plated contacts. Measurements Part H-5504.	Holds V201

TABLE OF REPLACEABLE PARTS

B. MODEL 59 POWER SUPPLY

SYMBOL	DESCRIPTION	FUNCTION
C1	CAPACITOR: fixed; electrolytic; two sections; 10 mfd. per section; 450 vdcw; metal case 2" lg. x 1" dia; two positive terminals; case is common negative terminal. Measurements Corporation Part H-5310.	Power supply filter capacitor
C2	CAPACITOR: Same as C1.	Same as C1
C7	CAPACITOR: fixed; paper; 500,000 mmf. +20% -10%; 600 vdcw; 1-13/16" lg. x 1" w. x 1" h. Measurements Corp. Part H-5180.	A.F. coupling
C8	CAPACITOR: Same as C7.	Same as C7
E1	LAMP: incandescent; 6-8 volts, 1/4 amp; bulb T-3-1/4 clear; 1-1/8" lg. o/a; miniature bayonet base; burn any position. Measurements Corp. Part H-5016.	Pilot lamp.
E2	KNOB: round; fluted; black phenolic resin; 1-1/8" dia. x 5/8" h; fits 1/4" dia. shaft; two #8-32 set screws; brass insert. Measurements Corp. Part H-2791.	Sensitivity control
E3	KNOB: bar; black phenolic resin; 1-1/4" lg. x 3/4" w. x 5/8" h; fits 1/4" dia. shaft; one #8-32 set screw; brass insert. Measurements Corp. Part H-4133	Function switch
H1	HANDLE: 5/16" dia. brass rod, chromium plated; 4-5/16" lg. x 1-9/16" h; one mtg. hole at each end; #8-32 x 1/2" d. on 4" ctrs. Measurements Corp. Part H-2024.	Power Supply carrying handle
H2	FOOT: mounting; felt cushion; 13/16" dia. x 1/4" h; threaded center post for mounting; 3/16" lg. x 6-32 thread. Measurements Corp. Part H-4204-2.	Power Supply supports

TABLE OF REPLACEABLE PARTS

B. MODEL 59 POWER SUPPLY

SYMBOL	DESCRIPTION	FUNCTION
I1	LIGHT: indicator; with lens for miniature bayonet base lamp; steel frame 1-23/32" lg. x 7/8" w. x 1-1/16" h; mounts in single hole 11/16" dia; red lens; smooth face; frosted back. Measurements Corp. Part H-5019.	Pilot light
J1	JACK: telephone; for two-conductor plug; single break contact; mounts in single 3/8" dia. hole; Measurements Corp. Part H-5312.	MOD input connection
J2	JACK: Same as J1	PHONES connection
J3	CONNECTOR: receptacle; eight female contacts; phenolic resin with metal mtg. plate; mounts in 1-5/32" dia. hole with two mtg. holes 0.156" dia. on 1-1/2" centers. Measurements Corp. Part H-5313.	Power supply to h.f.unit connection
L1	REACTOR: filter choke; one section; 5 henries ±10% at 40 ma. d.c; 300 ohms d.c. resistance; 2-3/8" lg. x 1-3/8" w. x 1-3/8" h. o/a; two mtg. holes 5/32" dia. on 2" ctrs. Measurements Corp. Part H-5075.	Rectifier filter
M1	METER: single arbitrary scale; GRID CURRENT, 0-100; 100 equal divisions; marked at every 20 divisions; black markings; white background; black pointer; 200 microampere movement; 400 ohms d.c. resistance; rectangular bakelite case; flange 4-17/64" w. x 31/32" h. x 45/64" d; barrel 2-3/4" dia. x 1" d. behind mtg. surface; two stud terminals at back; four mtg. holes 5/32" dia. at 3-5/8" horizontal x 3-5/16" vertical centers. Measurements Corp. Part H-740.	Indicated relative grid current
P1	CONNECTOR: plug; two male parallel blade contacts; integral part of cable W1.	Power connector

TABLE OF REPLACEABLE PARTS

B. MODEL 59 POWER SUPPLY

SYMBOL	DESCRIPTION	FUNCTION
R2	RESISTOR: fixed; composition; 680 ohms ±10%; 2 watts; 11/16" lg. x 5/16" dia; insulated; two axial wire leads. Measurements Corp. Part H-3734-681.	Voltage divider, meter bucking circuit
R3	RESISTOR: fixed; composition; 270,000 ohms ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; insulated; two axial wire leads. Measurements Corp. Part H-3728-274.	Same as R2
R5	RESISTOR: fixed, composition; 33,000 ohms ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; insulated; two axial wire leads. Measurements Corp. Part H-3728-333.	Same as R2
R6	RESISTOR: variable; composition; one section; 10,000 ohms ± 20%; 1/4 watt; C taper; three solder lug terminals; phenolic body; metal case; 15/16" dia. x 1/2" lg. extension; normal torque; no OFF position; mounted by 3/8"-32 bushing. Measurements Corp. Part H-5315.	Meter SENSITIVITY control
R7	RESISTOR: fixed, composition; 1000 ohms ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; insulated; two axial wire leads. Measurements Corp. Part H-3728-102.	Part of meter bucking circuit
R13	RESISTOR: fixed, wire wound; 1000 ohms ±10%; 10 watts; vitreous enamel coating; 1-3/4" lg. x 3/8" dia; radial solder lug terminal each end. Measurements Corp. Part H-5118.	Current limiter, B supply filter
R14	RESISTOR: fixed, composition; 5600 ohms ±10%; 2 watt; 11/16" lg. x 5/16" dia; insulated; two axial wire leads. Measurements Corp. Part H-3734-562.	Voltage dropping resistor, plate of oscillator tube
S1	SWITCH: toggle; SPST; molded phenolic body; 1-1/4" lg. x 11/16" w. x 11/16" d; 1/2" lg. ball tipped handle; locking action; back connected; two solder lug terminals; single hole mtg. bushing 15/32"-32 x 3/8" lg. Measurements Corp. Part H-383-1.	Power supply switch

TABLE OF REPLACEABLE PARTS

B. MODEL 59 POWER SUPPLY

SYMBOL	DESCRIPTION	FUNCTION
S2	SWITCH: rotary, three pole, three position; one pole not used; one section; phenolic wafer; brass silver plated contacts; non-shorting type contacts; 1-7/8" h. x 1-9/16" w. x 5/8" lg. from mtg. surface; 3/8"-32 x 1/4" lg. bushing; round metal shaft 1/4" dia. x 5/8" lg. from mtg. surface; shaft flatted for set screw. Measurements Corp. Part H-2140.	Power transformer
T1	TRANSFORMER: power; plate and filament type; input 117 volts, 50-60 cycles; single phase; three output windings; Sec. #1, 240-0-240 volts at .020 amp. d.c; Sec. #2, 5 volts at 2.0 amps; Sec. #3, 6 volts at 0.3 amps; shell type metal case 2-1/2" w. x 3" lg. x 2-3/4" d; two mtg. screws 8-32 thread on approx. 2-1/4" centers. Measurements Corp. Part H-2572.	Power transformer
V1	TUBE: electron; duodiode; RETMA #5Y3GT.	Rectifier
V2	TUBE: electron; diode; RETMA #0D3/VR150.	Voltage Regulator
W1	CABLE: power; electrical; two copper conductors, #18 AWG; rubber jacketed; rated 300 volts; 6 ft. lg; one end terminated in P1; other end not terminated. Measurements Corp. Part H-704.	Power cord.
XV1	SOCKET: electron tube; octal; eight spring brass cadmium plated contacts; round plastic body 1-3/16" dia. x 1/2" h. excluding terminals; one-piece saddle mtg; two mtg. holes 9/64" dia. on 1-1/2" centers. Measurements Corp. Part H-5056.	Holds V1
XV2	SOCKET: Same as XV1.	Holds V2

APPENDIX III

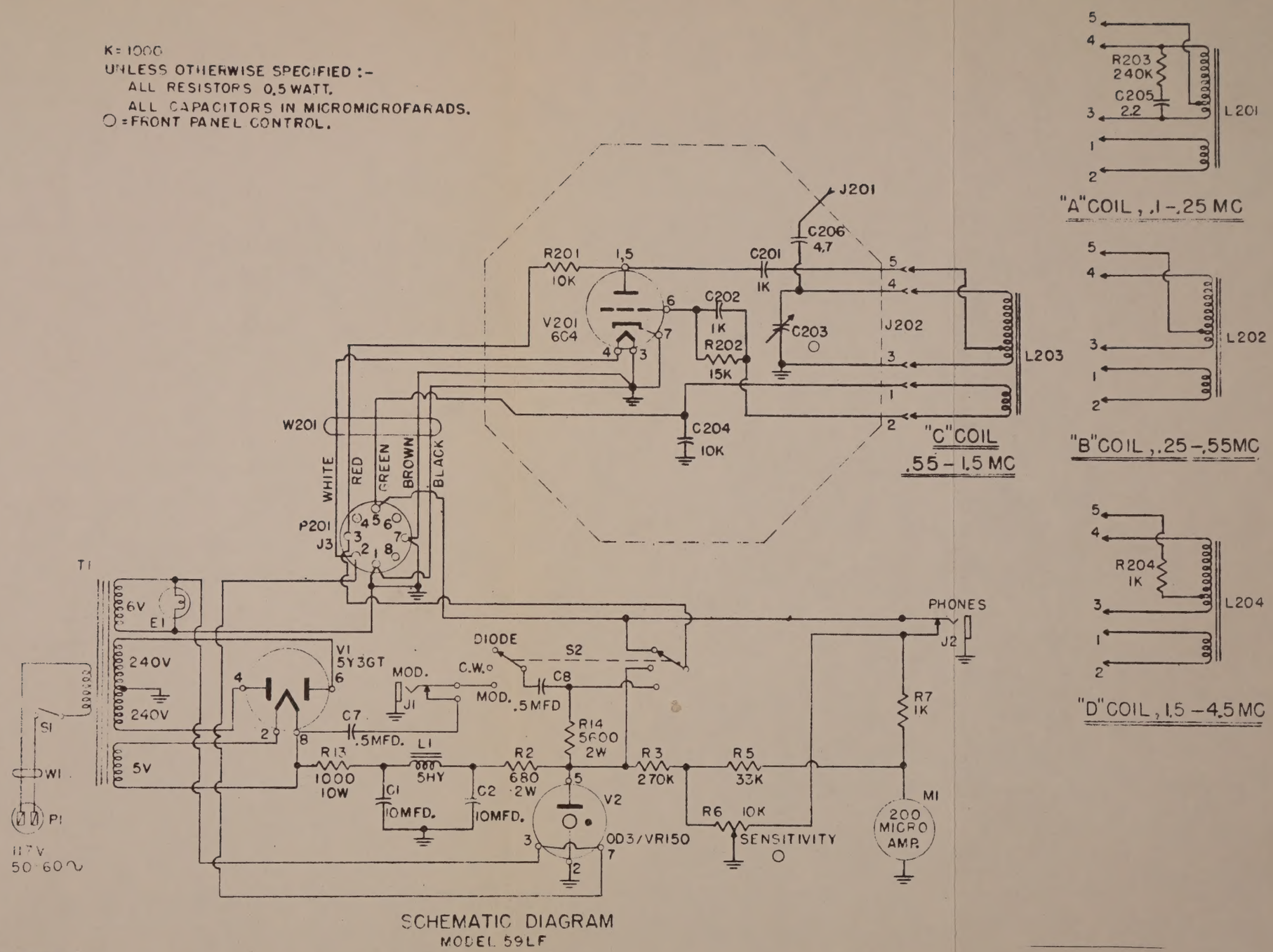
BIBLIOGRAPHY ON GRID-DIP METERS

1. Measurements Corp., "Operating Instructions for Megacycle Meter - Model 59".

2. Measurements Corp., Measurements Notes Number One, "The Elimination of Television Interference with the Aid of the Model 59 Megacycle Meter".

3. Measurements Corp., Measurements Notes Number Four, "Transmission Line Fault Location With the Megacycle Meter".

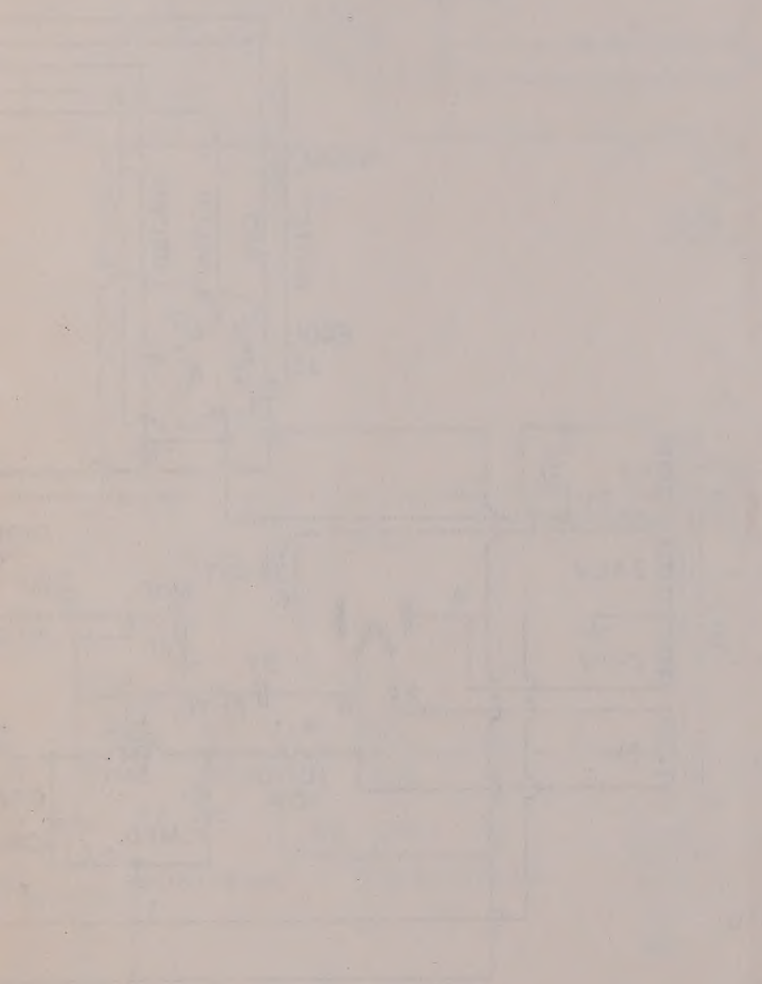
4. Measurements Corp., Measurements Notes Number Five, "Quartz Crystal Measurements with the Megacycle Meter".



SCHEMATIC DIAGRAM
MODEL 59LF

B-4904-C

Figure 1. Model 59 LF Megacycle Meter



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